

Message Text

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TO USMISSION OECD PARIS

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EXCON

E.O. 11652: XGDS-1

TAGS: ESTC, COCOM

SUBJECT: 1974 COCOM LIST REVIEW: IL 1757 -

TENTATIVE JAPANESE PROPOSAL RE GALLIUM COMPOUNDS

REF: OECD PARIS 2459

1) EXAMINATION OF THE JAPANESE PROPOSAL SHOWS THAT THE COMPOSITIONAL PARAMETER FOR EXCLUDING GALLIUM ARSENIDE PHOSPHIDE POSES SEVERAL PROBLEMS. A SIMPLISTIC CALCULATION OF THE PHOSPHORUS (P) CONTENT BASED UPON EQUIMOLAR COMPOSITIONS SHOWS THAT GALLIUM PHOSPHIDE (GAP) CONTAINS 30.7 PERCENT PHOSPHOROUS AND GALLIUM ARSENIDE PHOSPHIDE (GAAS-P) CONTAINS 17.6 PERCENT PHOSPHORUS. GALLIUM ARSENIDE PHOSPHIDE, HOWEVER, IS NOT A SIMPLE COMPOUND BUT IS GIVEN AS $\text{Ga}(\text{As}_{\text{SUBSCRIPT X}} \text{P}_{\text{SUBSCRIPT 1 MINUS X}})$. THIS FORMULA INDICATES THAT THE REACTIONS ARE NOT EQUIMOLAR AND THAT SEVERAL VARIETIES OF GAAS-P EXIST; HENCE, THE PHOSPHORUS CONTENT CANNOT BE CALCULATED EASILY WITHOUT KNOWING PRECISELY THE PHASE STRUCTURE OF THE MATERIAL. THE PREPARATION OF GAAS-P IS USUALLY ACCOMPLISHED BY COMBINING GAHS AND GAP IN SOME PRESELECTED RATIO. THIS COMBINATION IS REFERRED TO AS QUOTE ALLOYING

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UNQUOTE, BUT THIS TERM IS ERRONEOUS SINCE THE PROCEDURE

AND RESULTANT PRODUCT ARE NOT TRUE METALS BUT RATHER

METALLOIDS.

2) THE U.S. SUGGESTIONS OF SELECTING WAS DIRECTED TOWARD ELECTRICAL OR SOLID STATE PARAMETERS RATHER THAN COMPOSITION VALUES. SUCH CHARACTERISTICS AS DISLOCATION DENSITY, CARRIER CONCENTRATION, CARRIER TYPE, RESISTIVITY, ETC. WOULD BE MORE USEFUL FOR EXCEPTIONS NOTE PURPOSES. AS NOTED ABOVE, THE PHOSPHORUS CONTENT FOR GAAS-P IS 17.6 PERCENT; HENCE, THE VERY COMPOUND OF MOST INTEREST WOULD MEET THE CUT-OFF SUGGESTED BY THE JAPANESE. FINALLY, THE WORDING LEAVES A GAP WHEREBY PHOSPHORUS COULD BE INTRODUCED IN EXCESS OF 20 PERCENT, PERMITTING EXCLUSION UNDER THE NOTE, ONLY TO HAVE THE EXCESS PHOSPHORUS VAPORIZED AWAY BY SUBSEQUENT REFINING PROCESSES AT THE USER'S LOCATION. KISSINGER

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